October 1987 Vol. XII No. 10

ENDANGERED SPECIES

Technical Bulletin

Department of the Interior, U.S. Fish and Wildlife Service, Washington, D.C. 20204

Reintroduction of Rare Catfish is Proposed for Virginia Stream

A joint Federal/State effort to reestablish a population of the yellowfin madtom (*Noturus flavipinnus*), a rare species of catfish, into part of its historical range was proposed recently by the Service (F.R. 9/8/87). Under the proposal, the reintroduced fish would be designated a "non-essential experimental population."

The yellowfin madtom is a small species that once inhabited many streams in the upper Tennessee River basin. After much of this aquatic habitat was altered by impoundments and water pollution, the yellowfin madtom was reduced in range to three locations: Citico Creek in Monroe County, Tennessee; the Powell River in Hancock County, Tennessee; and Copper Creek in Scott and Russell Counties, Virginia. To prevent its further decline into extinction, this fish was listed in 1977 as a Threatened species.

Good habitat for the yellowfin madtom remains in the North Fork of the Holston River, Virginia. If the proposal to establish a non-essential experimental population in this stream is approved, the U.S. Fish and Wildlife Service, Tennessee Wildlife Resources Agency, and Virginia Commission of Game and Inland Fisheries will cooperate to bring fish in from the Citico Creek population to the Holston River. Current plans call for releasing 100 to 200 young-of-the-year yellowfin madtoms for 3 consecutive years, funds permitting. Special care would be taken not to jeopardize the donor population.

Designation of reintroduced species as experimental populations was authorized by the 1982 amendments to the Endangered Species Act. The goal was to promote wider acceptance of efforts to reintroduce Endangered and Threatened species by permitting greater management flexibility (see BULLETIN Vol. IX No. 9). A "non-essential" experimental population is one whose survival is not essential to the survival of the species as a whole. If the reintroduction proposal is approved, management authority for the experimental population will rest with the State of Virginia.

photo by J.R. Shute

Michael Etnier collecting yellowfin madtom eggs and fry in Citico Creek for laboratory propagation and research

photo by J.R. Shute

The yellowfin madtom is a small species of catfish that requires a slab rock substitute for nesting.

Endangered species program regional staff members reported the following activities for September:

Region 1 — Staffs from the Fish and Wildlife Service's Sacramento Endangered Species Office, California Department of Fish and Game, National Park Service, Presidio of San Francisco, Berkeley Botanical Garden, and Saratoga Horticultural Foundation recently assessed the progress of the Raven's manzanita (*Arctostaphylos pungens* var. *ravenii*) propagation and recovery effort. They found that propagation efforts have been highly successful because 65 rooted cuttings are now available for transfer to the wild. This represents a 30 to 40 percent survival rate of the cuttings taken during January 1987. In addition, the Berkeley Botanical Garden was able to germinate and grow one new plant from the seed of the single remaining wild plant. The genetic purity of the seedling has not yet been confirmed.

* * *

The presence of the Endangered Smith's blue butterfly (*Euphilotes enoptes smithi*) was recently confirmed in remnant coastal dune habitats at Sand City, Monterey County, California. The survey also documented the black legless lizard (*Anniella pulchra nigra*), a Category 2 listing candidate, and three candidate plant species. Because some of these dune habitats have been proposed for residential and commercial development, the City Council of Sand City tentatively agreed to seek development of a habitat conservation plan to protect the affected Endangered species and an incidental take permit, pursuant to Section 10(a) of the Endangered Species Act.

* * *

Contamination continues to spread from the 28th Street landfill within the City of Sacramento, California. Numerous elderberry plants, habitat of the Endangered valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), have been lost. The Director of the City's Public Works Department agreed to investigate the cause of the elderberry decline and any relationship with the contamination. The California Water Resources Control Board has documented high levels of numerous contaminants spreading from the landfill into the nearby American River.

* * *

Based on the recent report on the effects of the Salt Caves Project to the shortnose sucker (*Chasmistes brevirostris*), recently proposed for listing as Endangered, the Oregon Department of Environmental Quality denied a permit for the project. Larval shortnosed suckers could have been stranded if the Klamath River flows had been reduced.

Region 2 — Whooping crane (*Grus americana*) migration was delayed, apparently by mild weather, in both the Canadian and Rocky Mountain populations. Only a few individuals started southward during September from the summering areas.

Dr. Rod Drewien captured four wild sandhill cranes (*Grus canadensis*) in Idaho and shipped them to the Patuxent Wildlife Research Center in Maryland where they were placed in quarantine. They eventually will be force-paired with

(continued on next page)

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The ENDANGERED SPECIES TECHNICAL BULLETIN is published monthly by the U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

Regional News

(continued from previous page)

captive-reared birds and the pairs returned to Grays Lake for release next spring. This experiment is to develop techniques that might be applicable to promoting pairing and nesting among whooping cranes.

Dr. James Lewis, the Service's Whooping Crane Coordinator, met with the Canadian Whooping Crane Recovery Team in Regina, Saskatchewan. One item of discussion was Canadian sites that might become the location for a second captive flock.

* * *

In September, the Oklahoma Cooperative Fish and Wildlife Research Unit attached radio transmitters to six juvenile Ozark big-eared bats (*Plecotus townsendii ingens*). The radios weigh 0.75 grams each and last about 14 days; however, the glue that holds the radio on the bat only lasts about 10 days. The bats were tracked over a range of 3 miles with these radios. The research unit will continue its radio-tagging work next spring and summer after the bat hibernation period.

* * *

Biologists from the U.S. Forest Service, New Mexico Department of Game and Fish, and the U.S. Fish and Wildlife Service successfully transplanted approximately 300 Endangered Gila trout (*Salmo gilae*) from South Diamond Creek in the Aldo Leopold Wilderness to Trail Canyon Creek in the Gila Wilderness. The effort involved the use of two crews, one on South Diamond Creek where the fish were gathered and another on Trail Canyon Creek where the fish were stocked. A Forest Service helicopter was used to make the transfer. Establishment of a population of Gila trout in Trail Canyon Creek will enhance future recovery efforts by providing a source for Gila trout to introduce into Mogollon Creek, which will be the next stream to be renovated. With the Trail Creek stocking, each of the five wild populations of Gila trout have been restocked at least once, a critical step in the recovery of the species.

* * *

The Mexican Wolf Propagation Committee is evaluating a study on a lineage of captive wolves, known as the Ghost Ranch Mexican wolves, to determine if they should be integrated into the Service's wolf breeding program. The lineage of Mexican wolves *(Canis lupus baileyi)* in the current program was founded by three males and one female, a constant worry to population geneticists due to the small number. If the Ghost Ranch Mexican wolves are indeed pure wolves, they could be used to increase the genetic diversity of the Service's Mexican wolf propagation group by adding another two founding members. Additional comments on the electrophoretic and mitochondrial DNA study will be requested before the decision is made to cross the two Mexican wolf lineages.

Region 6 — The National Park Service funded a graduate student at Colorado State University to conduct a study in Rocky Mountain National Park on competition between the greenback cutthroat trout (*Salmo clarki stomias*), a Threatened species, and the brook trout (*Salvelinus fontinalis*). Results of this study indicate that the brook trout juveniles were the dominant competitor and that they excluded juvenile greenbacks from favorable stream positions. Evidence of interactions between greenbacks and brook trout greater than 6 inches (150 millimeters) in length was minimal; therefore, these interactions were not considered a major factor in cutthroat displacement. Low water years appeared to have negative impacts on greenbacks by reducing backwater habitat and forcing young-of-year greenbacks into the main channel where they must compete against larger fish and expend more energy to maintain stream position. For further information on this study, contact Dr. Fausch at Colorado State University in Fort Collins, Colorado, or Bruce Rosenlund, Fish and Wildlife Assistance Office, U.S. Fish and Wildlife Service, 730 Simms Street, Suite 292, Golden, Colorado 80401.

(continued on page 8)

Four Species Proposed for Endangered Species Act Protection

A freshwater clam, shrubby desert oak, and two fishes endemic to desert springs were proposed during September for listing as Threatened or Endangered species. If the proposals are made final, Endangered Species Act protection will be extended to these animals and plants:

James Spinymussel (*Pleurobema collina*)

North America has a rich diversity of freshwater clam or mussel species. These mollusks feed by filtering nutrients out of the water; however, as they take in food, they also concentrate pollutants in their body tissues. Many species declined in numbers and range when waterways became degraded by turbidity and pollution. Some mussels have become extinct, and 28 have been listed as Threatened or Endangered. Recently, the Service proposed listing another, the James spinymussel, as Endangered (F.R. 9/1/87).

Most juveniles of this species have one to three short but prominent spines on each valve (half-shell). The spines usually disappear by the adult stage, when the shells reach about 2 inches (5 centimeters) in length. Collection records indicate that this mussel once was widely distributed in the James River drainage system upstream of Richmond, Virginia. Although its decline probably started when municipal growth and industrialization in the James River basin began to affect water quality, the James spinymussel persisted in much of its range through the mid-1960's. Since then, the mussel has disappeared from up to 95 percent of its historical range. Survival is documented in only four headwater creeks in Craig and Botetourt Counties of Virginia and Monroe County, West Virginia.

Because the James spinymussel has been reduced in range to only a few relatively small areas, the species is vulnerable to rapid extinction. Potential threats to the remaining stream habitat include discharges from a sewage treatment plant, siltation from logging operations, runoff of agricultural fertilizers and pesticides, and stream channelization. Widespread die-offs of mussels have occurred in southwestern Virginia and, although the cause is unknown, similar die-offs in James spinymussel habitat could jeopardize the remaining population of this species. Competition from exotic species is yet another danger; the Asiatic clam (*Curbiculata fluminea*), a species accidentally introduced into the James River system, has been reported to occur at densities of more than 1,000 individuals per square meter downstream of Richmond. The spread of this exotic is closely correlated with the decline of the James spinymussel, and further spread could threaten the remaining spinymussel populations.

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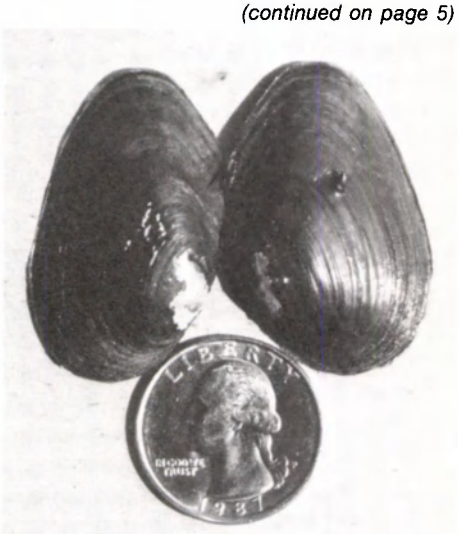


James spinymussels have one to three spines on each shell until they reach the adult stage.

photo by D. Neves

The following announcement was prepared by the University of Michigan

Expanding the Range of The Endangered Species Technical Bulletin

In 1981, cuts in the U.S. Fish & Wildlife Service budget forced the Office of Endangered Species to limit distribution of the Endangered Species Technical Bulletin. Prior to the cutbacks the bulletin was sent free of charge to anyone who wished to receive it. Since 1981, however, the Service has been able to distribute the bulletin to only federal and state agencies and official contacts of the Endangered Species Program.

The Endangered Species Update fills the gap left by this budget crunch. Published by the School of Natural Resources at The University of Michigan, the Update is part of a reprint program initiated in 1983. Since its inception, the program has established itself as an important forum for information exchange on endangered species issues. Recently the name of the reprint has been changed to the Update and the amount of supplementary information on species conservation efforts outside the federal program increased. In addition to providing a reprint of the latest issue of the ESTB, the newly designed Update includes:

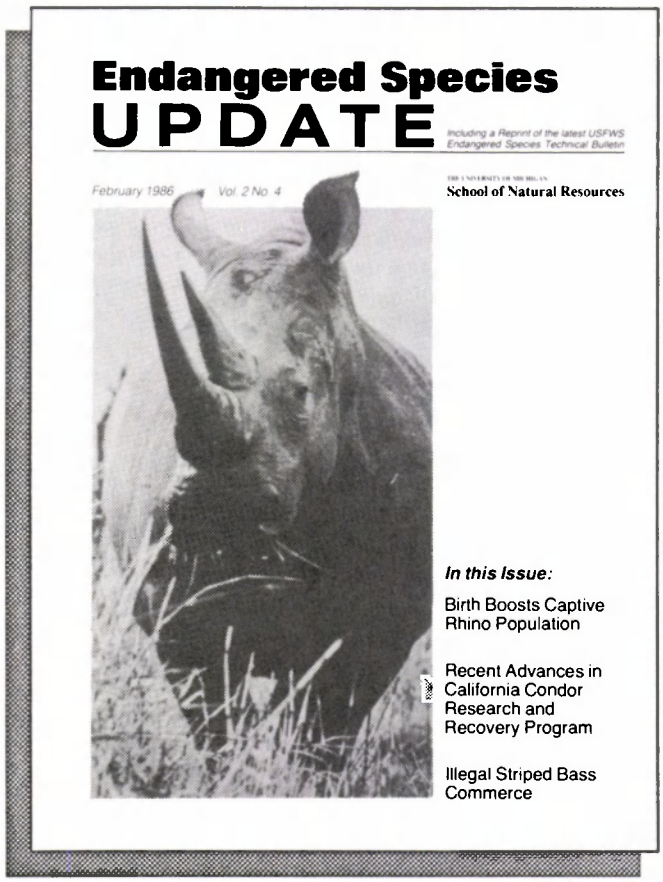
A Feature Article - Upcoming article topics include a 15 year retrospective on the Endangered Species Act, the private land trust movement and its contribution to species conservation, and global climate change and its effect on habitats.

A Book Review- covering a rccent publication in the field of species conservation.

Technical Notes - produced by The Center for Conservation Biology at Stanford University, this section will serve to provide information on current and ongoing research in the field.

Bulletin Board - listing upcoming meetings and current announcements.

In order to keep this unique source of information alive, it is important to let people know of its availability. If you know of anyone who might be interested in receiving the Endangered Species UPDATE, please pass on the subscription information. The annual subscription fee is only $15 for 12 monthly issues. This covers the cost of production and mailing. Every subscription is vitally important to the operation and improvement of the reprint program.



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Proposed Listings

(continued from page 3)

Hinckley Oak (*Quercus hinckleyi*)

The small but attractive Hinckley oak grows amid the Chihuahuan Desert scrub vegetation of Presidio County in western Texas. Only three small populations are known, each consisting of fewer than 60 plants. Because of potential threats to their survival, the Service has proposed to list the species as Threatened (F.R. 9/16/87).

Two of the populations are near Solitario Peak on a ranch that the owner plans to develop for exotic game hunting. Biologists fear that introduced animals may disturb the soil, trample the plants, and eat the acorns, leaves, or stems of the Hinckley oaks. The third population is found on private land along a road near the town of Shafter. Future road widening or realignment could eliminate part or all of this population unless precautions are taken.

Possible actions that could be taken to recover the Hinckley oak include the collection of acorns for cultivation and future reintroduction of young plants into suitable habitat; coordination with the Texas Highway Department to avoid impacts from road work; and conservation agreements with landowners.

photo by J.R. Shute

The small, holly-like leaves of the Hinckley oak last for more than one season, and the acorns are produced annually.

photo by A.M. Powell

The Hinckley oak, a shrubby tree that reaches a maximum height of only 4 feet, can occur as a single stem or as clonal groups that form dense thickets. It grows in the Chihuahuan Desert of western Texas.

Two Nevada Fishes

The **Clover Valley speckled dace (*Rhinichthys osculus oligoporus*)** and **Independence Valley speckled dace (*Rhinichthys osculus lethoporus*)**, small fish in the minnow family (Cyprinidae), are found only in small spring systems in the desert of northeastern Nevada. Their survival is threatened by their limited distribution, the use of spring flows for irrigation purposes, and the introduction of non-native fishes. Accordingly, both subspecies have been proposed by the Service for listing as Threatened (F.R. 9/18/87).

All habitats of both fishes are in Elko County on private lands used for ranching. The Clover Valley speckled dace survives at two sites and the Independence Valley subspecies is limited to one. Irrigation practices have relegated the fish to the springs, small downstream impoundments, and sections of the short spring outflows that connect them. Past use of herbicides on aquatic vegetation in the reservoirs also may have reduced fish numbers. Continued interest in controlling the growth of aquatic vegetation could lead to a resumption in the use of such chemicals.

Introductions of non-native species have been largely responsible for the decline and even extinction of some native western fishes, including the Independence Valley tui chub (*Gila bicolor isolata*). Springs inhabited by the two recently proposed speckled dace have been contaminated by smallmouth bass (*Micropterus salmoides*), rainbow trout (*Salmo gairdneri*), and bluegill (*Lepomis macirochirus*) that apparently were introduced for sport fishing purposes. These exotics are believed to prey on the native dace, keeping their numbers low.

If the two speckled dace subspecies are listed, the Service will seek agreements with the private landowners to allow for conservation and recovery activities. Specific management actions that might be negotiated include easements that would provide for sufficient water in springs and outflows during irrigation work, control of aquatic plants by means that would not harm the fish, and measures to control vandalism and further introductions of predatory fish.

Available Conservation Measures

Among the conservation benefits provided to a species if its listing under the Endangered Species Act is approved are: protection from adverse effects of Federal activities; prohibitions against certain practices; the requirement for the Service to develop and implement recovery plans; the authorization to negotiate land purchases or exchanges for important habitat; and the possibility of Federal aid to State or Commonwealth conservation departments that have signed Endangered Species Cooperative Agreements with the Service. Listing also lends greater recognition to a species' precarious status, which encourages further conservation efforts by

(continued on page 6)

Proposed Listings

(continued from page 5)

State and local agencies, independent organizations, and individuals.

Section 7 of the Act directs Federal agencies to use their legal authorities to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the survival of a listed species. If an agency finds that one of its activities may affect a listed species, it is required to consult with the Service on ways to avoid jeopardy. For species that are proposed for listing and for which jeopardy is found, Federal agencies are required to "confer" with the Service, although the results of such a conference are non-binding.

Further protection is authorized by Section 9 of the Act, which makes it illegal to take, possess, transport, or traffic in listed animals except by permit for certain conservation purposes. For plants, the rule is different; the prohibition against collecting applies only to listed plants found on lands under Federal jurisdiction. Some States, however, have their own laws against take of listed plants.

Protection is Approved for Eight Species

Final rules to list four animals and four plants as Threatened or Endangered species were published in the *Federal Register* during September 1987. Protection under the Endangered Species Act is now available to these taxa:

Bay Checkerspot Butterfly (*Euphydryas editha bayensis*)

A colorful, medium-sized butterfly, the bay checkerspot has a wingspan of up to 2¼ inches (56 millimeters). Its forewings have black bands that alternate with rows of bright red spots on yellow crescents, giving this butterfly a decidedly checkered appearance. The bay checkerspot depends on "islands" of serpentine grasslands that contain abundant growth of the butterfly's two larval foodplants, plantain (*Plantago erecta*) and owl's clover (*Orthocarpus densiflorus*).

Recorded historically from 16 areas on the San Francisco Peninsula and the adjacent outer Coast Range of central California, the bay checkerspot now is known to occur at only a few sites in the San Francisco Bay area. Much of its former habitat has been altered by drought, urban development, road construction, livestock overgrazing, and other land uses that altered native plant communities. A proposal to list the bay checkerspot as Threatened and to designate Critical Habitat for it was published in the September 11, 1984, *Federal Register* (see summary in BULLETIN Vol. IX No. 10). The final listing rule was published September 18, 1987, but a decision on the Critical Habitat designation was deferred in order to complete the required economic analyses.

Two Southern California Plants

Two rare plants native to southern California, the **slender-horned spineflower (*Centrostegia leptoceras*)** and **Santa Ana wooly-star (*Eriastrum densifolium* ssp. *sanctorum*)**, also are threatened with extinction because of habitat loss. Both occur on alluvial fan scrub lands within the Santa Ana River drainage. *C. leptoceras*, a small prostrate annual, has been reduced in range to 5 sites totalling less than 10 acres (4 hectares) in Riverside and San Bernardino Counties. *E. d.* ssp. *sanctorum*, a shrub that bears bright blue flowers, survives in scattered patches in San Bernardino County. Historical and continuing threats facing these plants include development within the floodplain, sand and gravel mining, livestock grazing, and competition from non-native plants. Both were proposed on April 9, 1986, for listing as Endangered (see BULLETIN Vol. XI No. 5), and the final rule was published September 28, 1987.

Pawnee Montane Skipper (*Hesperia leonardus montana*)

A small brownish-yellow butterfly, the Pawnee montane skipper is restricted to the South Platte River drainage in the Front Range of central Colorado. Within this region, the skipper inhabits open, dry, ponderosa pine (*Pinus ponderosa*) woodlands on steep slopes. Blue grama grass (*Bouteloua gracilis*), the larval food plant, and the prairie gayfeather (*Liatris punctata*), the primary nectar plant, are necessary parts of skipper habitat. Some habitat already has been eliminated by housing construction and other development, road building, and the Cheesman Reservoir. Construction of the proposed Two Forks Dam and Reservoir project, if completed as planned, also will affect the butterfly's habitat. After the Pawnee montane skipper was proposed on September 25, 1986, for listing as Threatened (see BULLETIN Vol. XI No. 10-11), the Fish and Wildlife Service began to confer with Federal land management and permitting agencies to achieve protection for the butterfly. The final listing rule was published September 25, 1987. Under Section 7 of the Act, these agencies are required to avoid any activities that are likely to jeopardize the butterfly's survival.

San Rafael Cactus (*Pediocactus despainii*)

This small, ball-shaped cactus shrinks below ground level during dry or cold seasons, and is noticeable only for a short time in spring when its bronze-tinted flowers are open. Two populations of the cactus are known, both of them on the San Rafael Swell, a large anticline or geological upwarp in Emery County, Utah. One of the populations is near a popular recreation area that is receiving heavy off-road vehicle use. Further, about half of the area occupied by both populations contains oil and gas leases as well as mining claims for gypsum and other minerals. The interest of some hobbyists in collecting wild specimens of rare cacti is another threat. A proposal to list the San Rafael cactus as an Endangered species was published in the March 27, 1986, *Federal Register* (see BULLETIN Vol. XI No. 4), and the final rule was issued September 16, 1987.

Blowout Penstemon (*Penstemon haydenii*)

Known only from the sandhills of Nebraska, this showy, blue-flowered perennial inhabits fresh blowouts (wind-scoured depressions in areas with sandy soils). The blowout penstemon was a common part of the sandhill vegetation early in this century, but efforts to stabilize active dunes have greatly reduced the amount of available habitat. Ten populations are known to survive in five counties, and slightly over half of the plants are on the Valentine and Crescent Lake National Wildlife Refuges. Nevertheless, the Service believes this species to be in danger of extinction. Because the populations are small, isolated, and apparently not vigorous, they are vulnerable to loss from localized environmental changes and natural vegetational succession. The blowout penstemon was proposed on April 29, 1986, for listing as an Endangered species

(continued on next page)

Final Listings

(continued from page 6)

(see BULLETIN Vol. XI No. 5), and the listing was made final September 1, 1987.

Little Colorado Spinedace (*Lepidomeda vittata*)

A small species in the minnow family, the Little Colorado spinedace is usually less than 4 inches (10 centimeters) in total length. It was abundant historically throughout the upper drainage of the Little Colorado River in Arizona, but it currently survives only in sections of five tributaries. Much of the species' free-flowing stream habitat was degraded or eliminated by impoundments, removal of water from the streams, channelization, grazing, road building, urban growth, and other activities. The introduction of non-native competing and predatory fish species, and the use of fish poisons to remove so-called "trash" fish, also contributed to the decline of the spinedace. Threats to this fish continue, and the Service proposed May 22, 1986, to list the Little Colorado spinedace as Threatened and to designate its Critical Habitat (see BULLETIN Vol. XI No. 6). The final listing rule, and a map of the 44 stream miles of Critical Habitat, were published in the September 16, 1987, *Federal Register*.

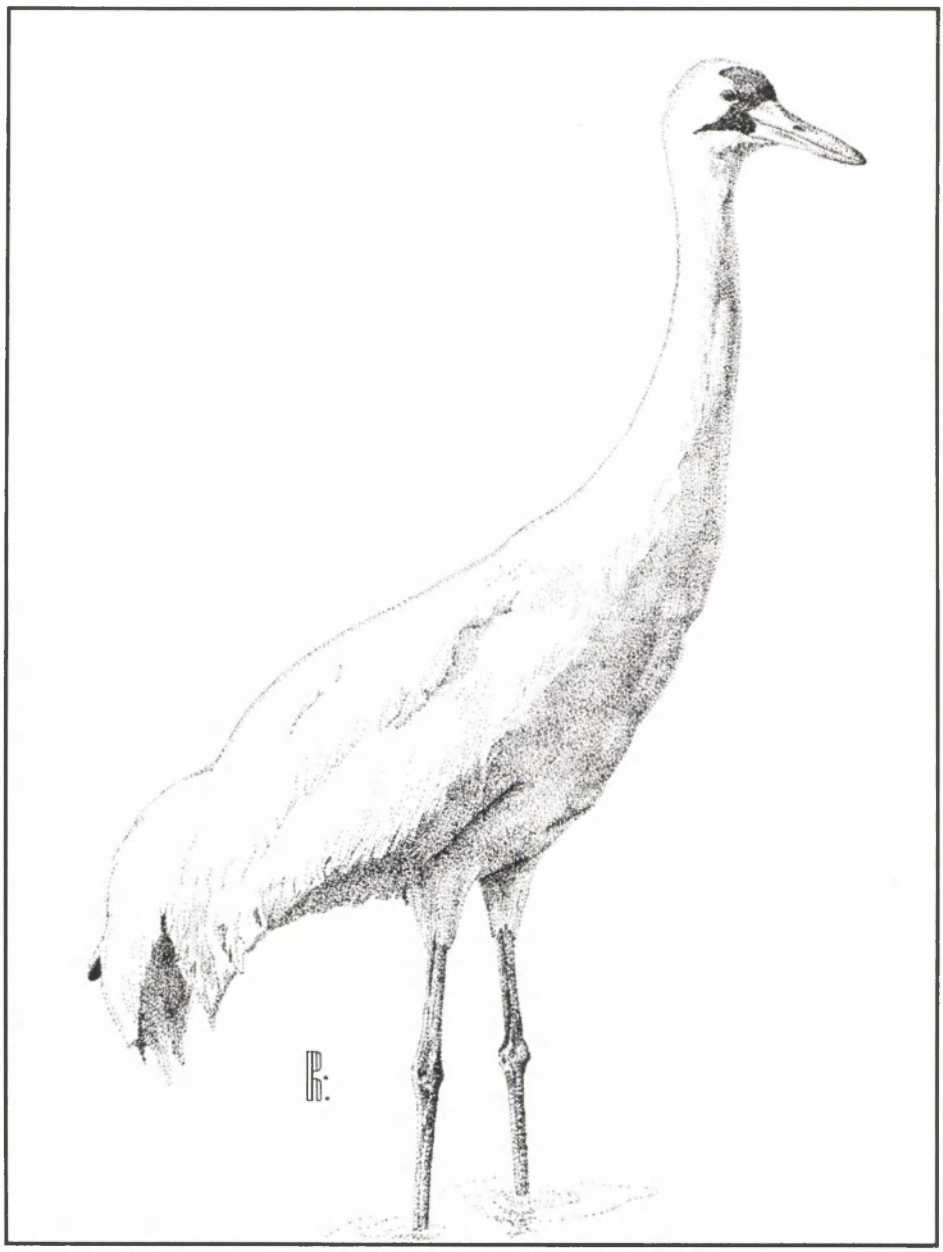
Cape Fear Shiner (*Notropis mekistocholas*)

Another rare fish, the Cape Fear shiner is restricted to three locations in the Cape Fear River drainage of eastern North Carolina. This species, which rarely exceeds 2 inches (5 centimeters) in length, inhabits free-flowing streams over rocky substrates. Reservoir construction flooded much of its former habitat, and deteriorating water quality is a continuing problem. The reduced range and low population levels increase the shiner's vulnerability to a single catastrophic event (e.g., a chemical spill). On July 11, 1986, the Service proposed to list the Cape Fear shiner as an Endangered species and to designate its Critical Habitat (see BULLETIN Vol. XI No. 8-9). The final listing rule, published in the October 25, 1987, *Federal Register*, contains a map of the approximately 17 river miles in four counties designated as Critical Habitat.

Possible Cause Identified in Deaths of Cranes at Patuxent Wildlife Research Center

Scientists suspect that a fungus-produced toxin that can occur naturally in feed grain is responsible for the illness that struck cranes at the Patuxent Wildlife Research Center at Laurel, Maryland, in September. Four birds belonging to Endangered species—three whooping cranes (*Grus americana*) and one Mississippi sandhill crane (*Grus canadensis pulla*)—were among the 16 cranes that died between September 19 and October 5. Quick action by Patuxent biologists and other scientists averted an even greater tragedy; over 110 other ill cranes responded well to treatment and are again healthy. No cranes have died at Patuxent since October 5.

A special response team from the Fish and Wildlife Service's National Wildlife Health Research Center in Madison, Wisconsin, was called in soon after the illness became apparent. Tests were conducted at Patuxent laboratories, at U.S. Department of Agriculture facilities in Ames, Iowa, and Beltsville, Maryland, and at the University of Maryland's Agriculture Department in College Park, Maryland. The sick birds were treated with fluids, antibiotics, and vitamins. After Patuxent biologists changed the food and water supply, the cranes began to act livelier and gain weight. The original water supply later was found to be safe.



Regional News

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The Bureau of Land Management, Forest Service, Fish and Wildlife Service, Colorado Department of Natural Resources, and Center for Conservation Biology at Stanford University in California are undertaking a study of the Uncompahgre fritillary butterfly (*Boloria acrocnema*). This candidate species is only known from two small isolated populations in southwestern Colorado. The larval food plant is the snow willow (*Salix nivalis*) and a variety of alpine plants serve as nectar sources for the adult. The flight season is usually from mid-July to early August and lasts approximately 2 weeks. Dr. Peter F. Brussard of Montana State University at Bozeman is conducting the study. He will assess the viability of the two existing populations and their continued existence by analyzing the species' distribution, habitat requirements, genetic variation in each population, and how that variation is distributed among the populations. The study is expected to be completed in March 1988.

Region 8 (Research) — A captive female Hawaiian crow or 'alala (*Corvus hawaiiensis*) died at the Olinda Endangered Species Propagation Facility on Maui June 10, 1987. Clinical history and necropsy done at the Service's National Wildlife Health Research Center in Wisconsin indicate that the bird was egg-bound and developed yolk peritonitis. There was a small fibrous mass on the wall of the oviduct that may have predisposed the bird to this problem. This death leaves eight Hawaiian crows in captivity and two known survivors in the wild.

The Patuxent Wildlife Research Center reported the first known case in which a wild male gray wolf (*Canis lupus*) in Minnesota successfully bred two females, both of which produced young. After breeding, the male spent all of his time with one female, while the other female became a single parent with a den about 14 miles (22.5 kilometers) away. On August 11, 1987, the male wolf was killed by a moose in the Superior National Forest, Minnesota. This is only the third known record of a wolf being killed by a moose.

One of the radioed wolves under study in the Superior National Forest, Minnesota, was killed when it wandered out of its territory and into the rendezvous site of an adjacent pack. The wolf was found with multiple bites to the throat, abdomen, and hind quarters.

BOX SCORE OF LISTINGS/RECOVERY PLANS

Category	ENDANGERED U.S. Only	ENDANGERED U.S. & Foreign	ENDANGERED Foreign Only	THREATENED U.S. Only	THREATENED U.S. & Foreign	THREATENED Foreign Only	SPECIES* TOTAL	SPECIES HAVING PLANS
Mammals	27	20	242	5	0	22	316	23
Birds	60	16	141	7	2	0	226	55
Reptiles	8	6	60	11	4	13	102	21
Amphibians	5	0	8	4	0	0	17	6
Fishes	40	4	11	25	6	0	86	45
Snails	3	0	1	5	0	0	9	7
Clams	28	0	2	0	0	0	30	21
Crustaceans	5	0	0	1	0	0	6	1
Insects	8	0	0	7	0	0	15	12
Plants	130	6	1	28	3	2	170	56
TOTAL	314	52	466	93	15	37	977	247**

*Separate populations of a species that are listed as Endangered and Threatened are tallied twice. Species thus accounted for are the gray wolf, bald eagle, green sea turtle, olive ridley sea turtle, leopard, and piping plover.

**More than one species may be covered by some plans, and a few species have more than one plan covering different parts of their ranges.

Number of Recovery Plans approved: 213
Number of species currently proposed for listing: 19 animals
32 plants

Number of Species with Critical Habitats determined: 100
Number of Cooperative Agreements signed with States and Territories: 49 fish & wildlife
34 plants

September 30, 1987

October 1987 **Vol. XII No. 10**

ENDANGERED SPECIES

Technical Bulletin

Department of the Interior, U.S. Fish and Wildlife Service, Washington, D.C. 20240